

Shipping Containerized U.S. Agricultural Products to Thailand



Map of Thailand

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In the 1980's Thailand was plagued with congestion to such a point that international ocean shipping companies charged an substantial extra fee for service to Bangkok. Klong Toey, situated in the heart of southeast Bangkok, was heavily congested and waits for berth space took exceptionally long. The 1991 opening of Laem Chabang, a deep-water port approximately 90 miles south of Bangkok, eased congestion considerably and allowed for expanded maritime trade. But the new port suffers from traffic congestion, endemic to the Bangkok area, and Laem Chabang has yet to operate at full capacity. Thailand's financial crisis has impacted the maritime sector and slowed completion of Laem Chabang's dredging to 15 meters and the completion of a new container terminal. Also moving slowly is the reorganization of the container terminal (East Quay) in Klong Toey, which handles 80 percent of that port's container traffic. Container throughput at Klong Toey and Laem Chabang are about equal. Song Khla, a smaller port in the southern peninsular, handles about 10 percent of the trade.

From the perspective of the US agricultural exporter and the Thai importer, the ocean liner industry, composed of shipping lines like Sea-Land, Maersk, and American President Lines, are a vital link between US farms and the Thai consumer. Understanding which shipping firms are doing the majority of the business, how perishable products move through Asia to Thailand, how shipping firms price their services, and what can be done to maintain product quality while lowering shipping costs, is essential to establishing long-term, profitable marketing operations.

US agricultural producers employ the latest "cold chain" technologies to ensure a product can sustain shipments to far distant overseas markets. Thai importers can increase profits and ensure continued sales by delivering top quality products at reasonable costs.

Major Agricultural Commodities in US to Thailand Liner Trades

Table 1 below lists the top ten agricultural commodities shipped in containers from the United States to Thailand for 1997 and 1998. Total shipments of containerized agricultural commodities for 1997 were 20,284 TEU's or twenty-foot equivalent units, a standard measure used in ocean shipping. In 1998, a total of 13,589 TEU's of agricultural goods reached Thailand, a substantial decrease from 1997 owing to Thailand's economic situation. A 20-foot container generally weighs between 9 and 15 tons depending on the commodity.

Cotton, the top import from the United States, decreased by 7 percent over the previous year. Fruits, mainly apples, pears, and grapes, decreased much more, by 66 percent in 1998. Generally, perishable products, which include vegetables, dairy products, as well as fruit, comprised 2,484 TEU's in 1998, or 18 percent of containerized movements into

Thailand from the United States. Soups, pastes, sauces, cotton, hides, fish meal, tobacco and grain products were other predominant products imported by container. Bulk grains, both for animal and human consumption, are generally shipped on bulk vessels but a good percentage also is shipped in containers. The container allows for transit to more remote locations where bulk transport, handling, and storage are not generally available.

Table 1: Top 10 US Agricultural Commodities Exported to Thailand 1997 and 1998

Rank	Commodity (12mo.) (Jan -Dec 1997)	TEU*	% of total	Commodity (12mo.) (Jan -Dec 1998)	TEU*	% of total
1	Cotton, Fabric	4908	24%	Cotton, Fabric	4546	33%
2	Fruit (Apples, Grapes)	3336	16%	Animal Feed	1309	10%
3	Animal Feed	2401	12%	Fruit (Apples, Grapes)	1132	8%
4	Fish Meal	1502	7%	Hides, Skins, Leather	1006	7%
5	Tobacco, Leaf	1335	7%	Tobacco, Leaf	862	6%
6	Hides, Skins, Leather	1121	6%	Pastes, Sauces, Soups	765	6%
7	Dairy Products (+Eggs)	841	4%	Dairy Products (+Eggs)	739	5%
8	Vegetables (Froz. Potatoes)	757	4%	Wheat, Flour, Cereal	687	5%
9	Pastes, Sauces, Soups	609	3%	Vegetables (Froz. Potatoes)	613	5%
10	Wheat, Flour, Cereal	547	3%	Soybeans, Soy Products	306	2%
	Other ag commodities	2927	14%	Other ag commodities	1627	12%
	Total	20,284	100%	Total	13,589	100%

*TEU is twenty-foot equivalent container units. Both 20-foot and 40-foot containers are regularly used in the US-Thai trades. (Source: PIERS, Journal of Commerce, New York)

Major Shipping Lines in the US to Thailand Trade

A major advantage of the ocean container shipping market is the degree of competition which exists. Competition among shipping lines tends to drive down shipping rates and increase services. Policies of the Governments of the Thailand and the United States encourage world-wide shipping lines to call at each nation's ports allowing shippers a wide range of shipping services and more frequent service. Table 2 below lists the top 10 shipping lines serving the US-Thailand trades in 1997 and 1998.

Because carriers sometimes specialize in services (refrigerated containers versus non-refrigerated or dry containers) or commodities (some carriers have contracts with major shippers of cotton or other products), the ranking of top shipping lines is likely to change from year to year due to changes in the types of products imported. Carriers with a large market share for refrigerated shipments to Thailand are Hyundai, OOCL, Maersk, Mitsui and Sea-Land.

Table 2: Top 10 Shipping Lines for Agricultural Commodities, Calendar 1997 and 1998.

Rank	Shipping Line (12mo.) (Jan -Dec 1997)	TEU*	% mkt share	Shipping Line (12 mo.) (Jan -Dec 1998)	TEU*	% mkt share
1	Evergreen	2397	12%	Hanjin	2176	16%
2	Sea-Land	2349	12%	Evergreen	1923	14%
3	Hanjin	2078	10%	Mitsui OSK	1344	10%
4	Mitsui OSK	1876	9%	Sea-Land	1208	9%
5	Maersk	1768	9%	NYK Line	1038	8%
6	COSCO	1411	7%	Yang Ming	1009	7%
7	Hyundai	1390	7%	Hyundai	975	7%
8	Yang Ming	1385	7%	APL-NOL	830	6%
9	Neptune Orient	1351	7%	OOCL	698	5%
10	OOCL	1150	6%	K Line	641	5%
	Other	3131	15%	Other	1,747	13%
	Total	20,284	100%	Total	13,589	100%

* TEU is twenty-foot equivalent container units.

On May 1, 1999, new U.S. regulations concerning all ocean shipping companies which call on U.S. ports took effect. Probably the most dramatic event has been the demise of ocean shipping cartels, notably the Transpacific Westbound Rate Agreement which dominated pricing in the U.S. to Asia trades. Ocean carriers are still allowed to meet and discuss rate levels and capacity in the trades but the cartels are much less disciplined and carriers do not necessarily have to maintain standard rate levels. These changes have largely been brought about by newer, more liberal confidential contracting arrangements which are now possible between shippers and ocean carriers. Industry officials believe that 80 to 90 percent of all container movements will eventually move under contract. U.S. exporters and Thai importers should explore establishing contractual shipping services with one or several carriers as a way of reducing rates or setting service standards. Shipper associations, whether for import or export, are being formed to pool container volumes and enhance shipper bargaining power when negotiating with carriers.

Major U.S. to Thailand Shipping Routes

About 86 percent of the containers shipped (primarily) from US West Coast ports must be transshipped through other Asian ports before arrival. Only about 14 percent of cargoes reached Thailand directly in 1998, up slightly from 13 percent in 1997. Insufficient port depth (in Klong Toey) and the lack of sufficient Thailand-bound cargoes per ship are among the reasons ocean liner companies prefer to transfer containers into smaller vessels from the larger (4,000 to 6,000 TEU) vessels which regularly leave the United States.

Table 3 below lists the major transshipment points in years 1996, 1997, and 1998. For all years, Singapore, Hong Kong, and Kaohsiung, Taiwan have handled roughly equal amounts of US transshipment traffic for Thailand. Hong Kong lost market share in 1998 at the expense of Kaohsiung and other (mostly Japanese) ports. Bangkok, including Laem Chabang, received 14 percent of cargoes directly from the United States in 1998.

Rank	1996	1997	1998
1	Singapore (39%)	Singapore (32%)	Singapore (31%)
2	Hong Kong (26%)	Kaohsiung (26%)	Kaohsiung (29%)
3	Kaohsiung (15%)	Hong Kong (25%)	Hong Kong (16%)
4	Other (6%)	Other (3%)	Other (10%)
	<i>Bangkok [direct]* (14%)</i>	<i>Bangkok [direct] * (13%)</i>	<i>Bangkok [direct] * (14%)</i>
	Total (100%)	Total (100%)	Total (100%)

*Includes Laem Chabang and Song Khla (Source: PIERS, Journal of Commerce, New York)

Thai International Container Ports

Thailand has three container terminal facilities: Klong Toey, Bangkok's old port, Laem Chabang, Thailand's modern port approximately 90 miles south of Bangkok, and Song Khla, a smaller port in the southern peninsular. Bangkok and Laem Chabang each receive about 45 percent of the arriving containers and Song Khla receives the remaining 10 percent. The US-Thai trade is down about 60 percent from what it was before the economic downturn.

Feeder vessels from Kaohsiung, Singapore, and Hong Kong generally run about 1500 TEU into Laem Chabang as the port has a 14 meter draft. Because Bangkok only has a 10-foot draft, feeder vessels serving the port are generally in the 600 TEU range. Laem Chabang container handling efficiency is about 25 container moves per crane per hour while Bangkok can move only about 14 container moves per crane per hour.

While total containers handled at Laem Chabang and Bangkok are roughly equal, fruit importers use Bangkok exclusively because it is near their facilities in Bangkok's Chinatown. Also, fruit importers are used to dealing with Bangkok customs officials and

have developed classification systems for imported goods which satisfy both parties. Due to Thailand's growing export market for seafood, fruits and vegetables, 100 percent of refrigerated containers are exported full, a rarity in Asia. Empty refrigerated containers must be imported to satisfy the export demand.

For food products arriving at Laem Chabang, carriers will deliver free to Bangkok if Bangkok is listed as the final destination on the bill of lading. If not, the importer must pick up the goods or container as it is considered a domestic delivery. Foreign companies are prohibited from domestic transport activities. When carriers do deliver to the Bangkok area, they either transport containers by truck to the "STC" container terminal yard (about 21 kilometers from Bangkok) or rail the containers from Laem Chabang to Lad Krabang, another container terminal yard about 30 kilometers from Bangkok. The truck transfer takes about 3 hours. The train service takes somewhat longer but is viewed as very efficient, running 4 trains per day with 30 containers per haul. Both rail and truck yards are strategically placed in the heart of new industrial sites.

Song Khla port is also serviced by feeder vessels but receives no direct service from the United States. Song Kala has no cranes and relies on ship's gear to unload containers. The port does have reefer plugs at the port to receive perishable traffic. About 10 percent of Thai container traffic is handled through Song Kala.

Ocean carriers estimate that 30 to 40 percent of US-Thai trade enters Thailand over the Malaysian border to avoid high Thai customs duties. US goods are shipped to Malaysian ports and are then trucked up to Bangkok.

Internal Distribution Methods

As mentioned previously, all containers holding fresh fruits or vegetables arrive in Bangkok. Containers can be trucked to refrigerated warehouses close to the port but generally they are unloaded in the port's container yard. Importers employ 6-wheel, 3-ton nonrefrigerated trucks to unload the container and either deliver right to customers or to their own warehouses for storage. Importers do not generally use refrigerated trucks as the distance to delivery points is short, usually taking about an hour.

Containers from Laem Chabang are delivered to Bangkok's STC container terminal in three to four hours, depending on traffic. If the refrigerated container contains perishable products (e.g., frozen meat), a gen-set is attached to power the refrigeration unit. Importers also hire trucks to pick up cargoes in Laem Chabang at about \$90 for a 3-ton vehicle. Costs are about equal using Laem Chabang or Bangkok (Klong Toey), but Bangkok is more convenient for most importers. Truck shipments of imported product are refrigerated to Chiang Mai and other cities in northern Thailand.

One cold storage and distribution business in Bangkok imports 80 percent of US meat and 98 percent of U.S. french fries into Thailand. The company operates out of central Bangkok and 85 percent of commodities imported are redistributed in the Bangkok area.

The company sees potential for growth outside the Bangkok area and does distribute upcountry.

The Chiang Mai region is a major growing area for fruits and, more so, vegetables. Iceberg lettuce, zucchini, romaine lettuce, radishes, cauliflower, broccoli, and carrots, both fresh and frozen, are brought down in refrigerated trucks. Trucks returning to Chiang Mai usually carry meat, french fries, turkeys, and fruit. The cost for a 40-foot refrigerated truck shipment between Chiang Mai and Bangkok is \$350 to \$550, depending on the season and backhaul potential. The 800 to 900 kilometer trip takes 14 hours. Refrigerated trucks are very expensive and refrigeration units are often damaged due to poor road conditions. Shippers estimate 30 to 40 percent of fruit is wasted after harvest due to lack of refrigeration.

Local Bangkok-area fruit and vegetable production is usually delivered to markets or stores in nonrefrigerated, small trucks. Distances are short, deliveries are usually made in the morning when it is relatively cool and traffic congestion is less severe. There is some use of refrigerated trucks for local deliveries but that is an exception.

Air Transportation

Two companies have total control of receiving and storage at Bangkok's airport. They handle very little imported perishable traffic, although they do receive shipments of apples, grapes and meat and have cold rooms for temporary storage. Between the two companies, less than 400 tons (about 20 ocean container loads) of perishable products are imported annually. Air freight costs usually run about \$0.60 to \$0.80 per pound which is nearly 10 times more expensive than ocean freight. Far greater quantities of high-valued Thai seafood, fruits and vegetables are exported and many fruits do not require chilling. Air freight tonnage is about 25 percent below its normal level because of the economic downturn.

Under consideration is a new "airborne" industrial park south of the present-day airport. The new airport, to be called Nong Wu Hoa, would operate primarily as a cargo port and use adjacent land for industrial development that would lend itself to air freight. Part of what the cargo officials intend to capitalize on is the growing export market for Thai fruits and seafood. Officials do expect some perishable imports to move through the cargo facility. Construction is expected to begin 2 years from now and it will take 5 to 6 years to complete the whole facility.

Thai Frozen Seafood Exports

Thailand's frozen seafood exports are of interest because the refrigerated container movements offer US exporters consistent opportunities for backhauls. Seafood is exported from both Laem Chabang and Klung Toey (Bangkok). The average shipping rate is about \$3000 to the US west coast for a 40-foot, high-cube refrigerated container with 30 metric tons of fish per container. The Thai Shipping Association was formed to deal with setting a contract rate with the ocean shipping companies. TSA has signed

contracts with the east-bound carriers to ship a 40-foot container for as low as \$2000 to \$2500 per container depending on destination.

It takes between 18 and 22 days to reach the west coast of the United States from Thailand. It takes an additional 5 days to reach the US east coast by truck. The all-water route to the US east coast takes 30 to 40 days. Customs clearance sometimes takes 1 month. The amount of transit days is important because time affects the seafood quality, market price, and cost of capital invested in the purchase of the seafood. One container of seafood is worth approximately \$250,000. Even though shipping costs are roughly only 1 percent of value, the margins on the sale are so small that ocean shipping rate is still an important factor.

The Cost of Importing Into Thailand

As mentioned previously, Thailand's dependence on transshipment from other countries can add extra costs and increase transit times relative to other Asian ports. In table 5 and table 6 below, the rates charged by ocean carriers serving selected Asian ports are compared for both apples and grapes. In the case of apple shipments from Seattle, WA, costs are from 17 percent (Taiwan) to 12 percent (Hong Kong) cheaper into other Asian ports than into Thailand's ports (table 5). Surprisingly, rates charged to Singapore, a main transshipment hub, are just slightly higher by 3 percent. The higher rate into Singapore is probably due to high port charges for berthing and container handling.

Because some of the ports differ considerably in distance from the United States, the rates to destinations selected were divided by the statute miles to compute a "cost per mile" figure for a representative container of apples. Discounting distance in this way, costs to Thailand were very much in line with other ports at \$0.44 cents per container mile.

Table 5: Comparison of Refrigerated Ocean Container Rates for Apples from Seattle to Select Asian Ports*

Country	Apple Rate April 1999*	\$ Difference Thailand rate	% Difference Thailand rate	Approx. Distance (st. miles)	Cost per Mile
Taiwan	\$2,469	(-) \$518	(-) 17%	5323	\$0.46
Hong Kong	\$2,627	(-) \$360	(-) 12%	5634	\$0.47
The Philippines	\$2,534	(-) \$453	(-) 15%	5777	\$0.44
Singapore	\$3,064	(+) \$77	(+) 3%	7013	\$0.44
Thailand	\$2,987	-----	-----	6472	\$0.46

* Weighted average for one 40-foot container by market share of all carriers serving trade lane for this Commodity based on tariffs filed at the US Federal Maritime Commission, April 15, 1999.

In the case of grape shipments from Los Angeles/Long Beach to Hong Kong, it is evident that somewhat of a "price war" continues to occur. Rates for grapes are almost always higher than those for apples by nearly twice as much. Carriers usually practice "value of service" pricing, meaning they charge what the traffic can bear. Grapes are more valuable (per container) than apples and more perishable, so ocean carriers know they can charge more and do. The costs to the ocean carrier are no more for carrying apples than grapes, i.e., same ship, same type of container.

Overall, grape rates into Bangkok were more expensive than other ports by about the same amount as apple rates, if we exclude Hong Kong. Rates have generally been falling in the Pacific trades and both apples and grapes into Bangkok have been reduced by \$360 and \$1,629, respectively, since July 1998.

Country	Grape Rate April 1999*	\$ Difference Thailand rate	% Difference Thailand rate	Approx. Distance (st. miles)	Cost per Mile
Taiwan	\$3,156	(-) \$375	(-) 11%	5323	\$0.59
Hong Kong	\$1,540	(-) \$1,991	(-) 56%	5634	\$0.27
The Philippines	\$3,142	(-) \$389	(-) 11%	5777	\$0.54
Singapore	\$3,386	(-) \$145	(-) 4%	7013	\$0.48
Thailand	\$3,531	-----	-----	6472	\$0.55

* Weighted average for one 40-foot container by market share of all carriers serving trade lane for this Commodity based on tariffs filed at the US Federal Maritime Commission, April 15, 1999.

It should be emphasized that using a cost-per-mile figure has its limitations because a vessel may stop at one or more ports before it arrives at a particular port. Increased volumes of Thai-bound cargoes will increase the amount of direct service from the United States and lower ocean freight rates. Contingent on increased volumes will be further development of container facilities.

Summary

This section dealt mainly with the ocean carrier industry which serves the US-Thai trades, and a discussion of the "cold chain" as it relates to transport from the ports to Bangkok and other Thai cities. The discussion concerning inland distribution in Thailand, associated transport costs, and how product quality is maintained until it reaches the Thai consumer reveals a system which is slowly modernizing. US efforts to provide technical assistance and information will improve our efforts to increase perishable product exports in the future.

(Questions or comments regarding this analysis should be directed to Jim Caron, Transportation and Marketing, [AMS/USDA](#), 202-690-1304/fax 690-1340, or Internet: Jim.Caron@USDA.gov, [Commodity, carrier, and ocean rate data compiled by [Heidi Reichert](#) and [Ron Hagen](#), [OCEAN Rate Bulletin Team](#), USDA], May 15, 1999.

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